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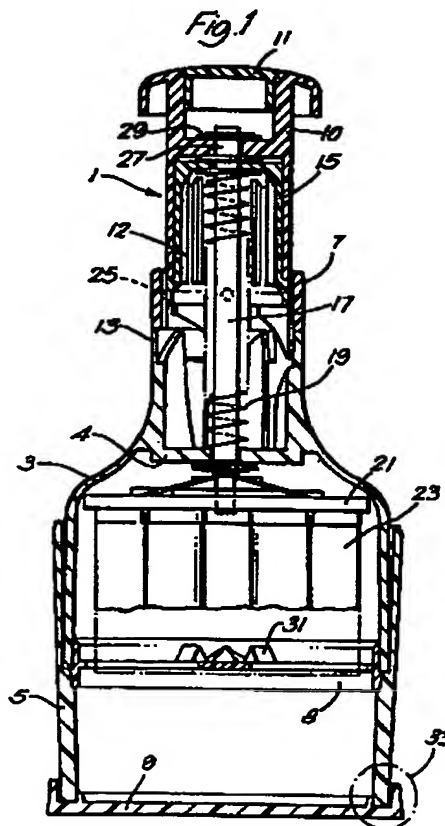
GB 1558549 A GB 0889577 A GB 0853837 A  
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INT CL<sup>6</sup> B02C

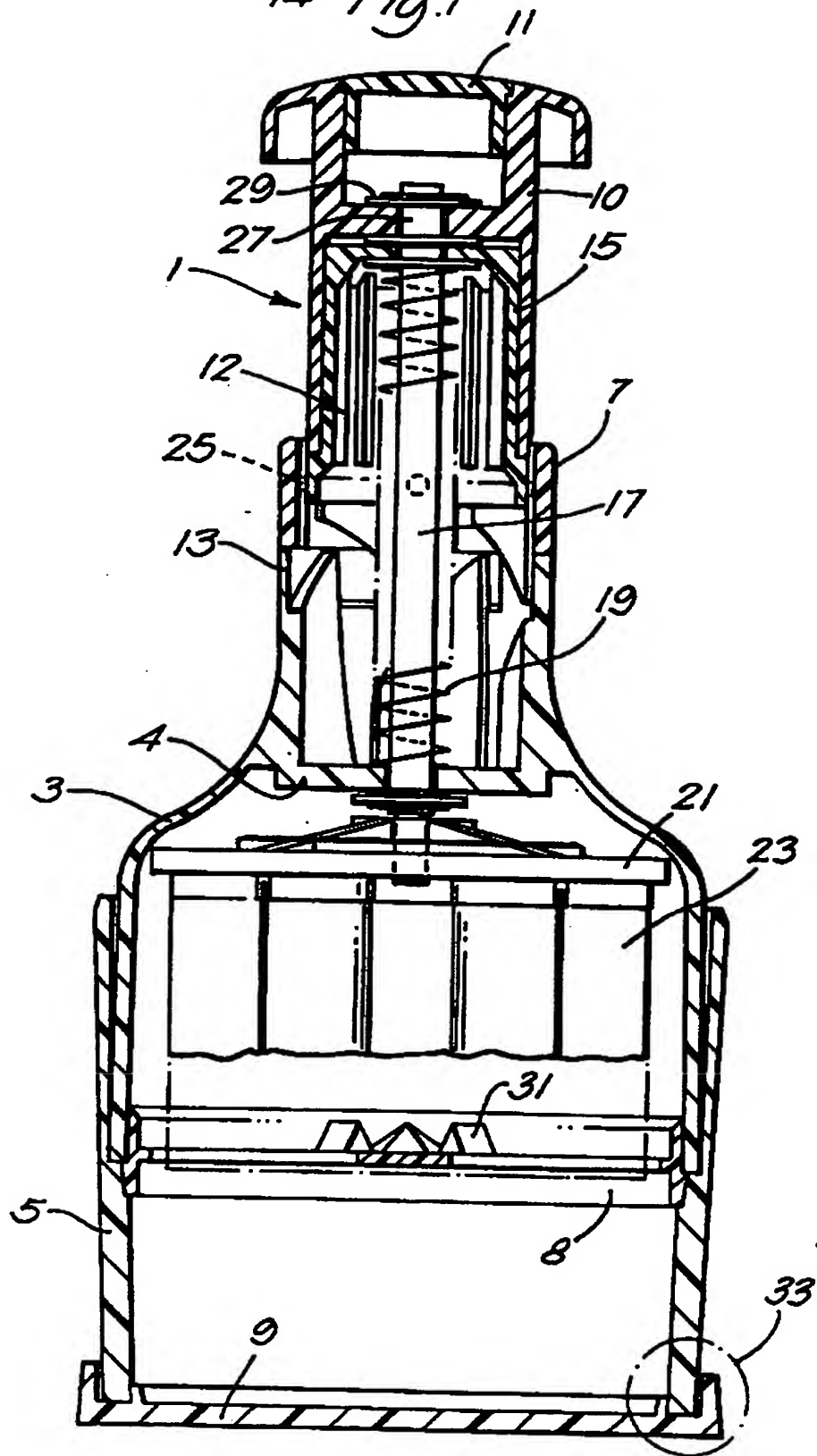
(54) Improvements to food choppers

(57) A device for chopping foodstuffs comprising: a cup shaped housing 3 to be disposed in an inverted position over the foodstuff to be chopped; an actuating stem 15 disposed in the housing 3 and extending therefrom, said actuating stem 15 having an impact button 10 provided thereon; a cutting member 21, 23 provided within the housing 3 to make impact with the foodstuff when pressed in a downward direction through a stripper plate 8 in opposition to energy storage means 19; an actuating axle 17 for joining said cutting member 21, 23 to said actuating stem 15; a cylinder 5 mountable on said housing thereby defining an area into which the foodstuffs to be chopped may be placed; and, rotation means 7, 13 acting with said actuation stem 15 to rotate said cutting member 21, 23 on actuation of the device.



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1/4 Fig. 1



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Fig. 2a

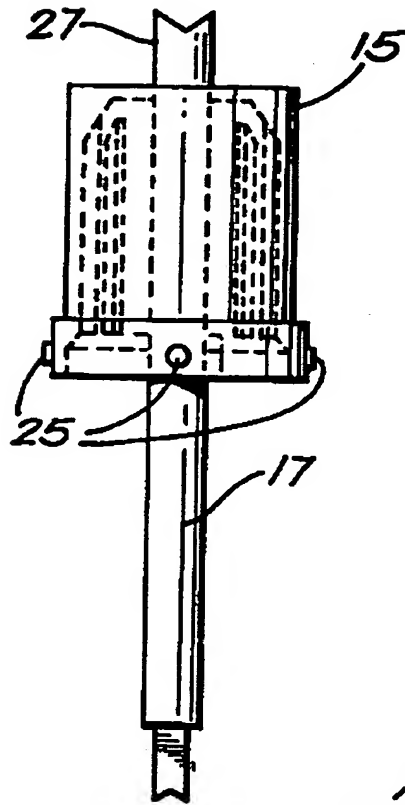


Fig. 2b

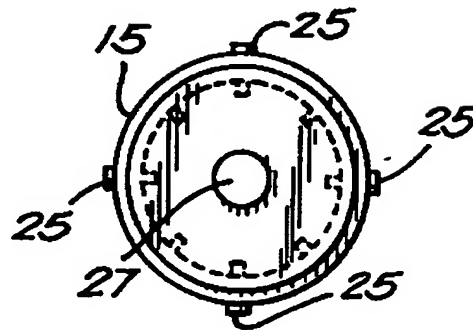
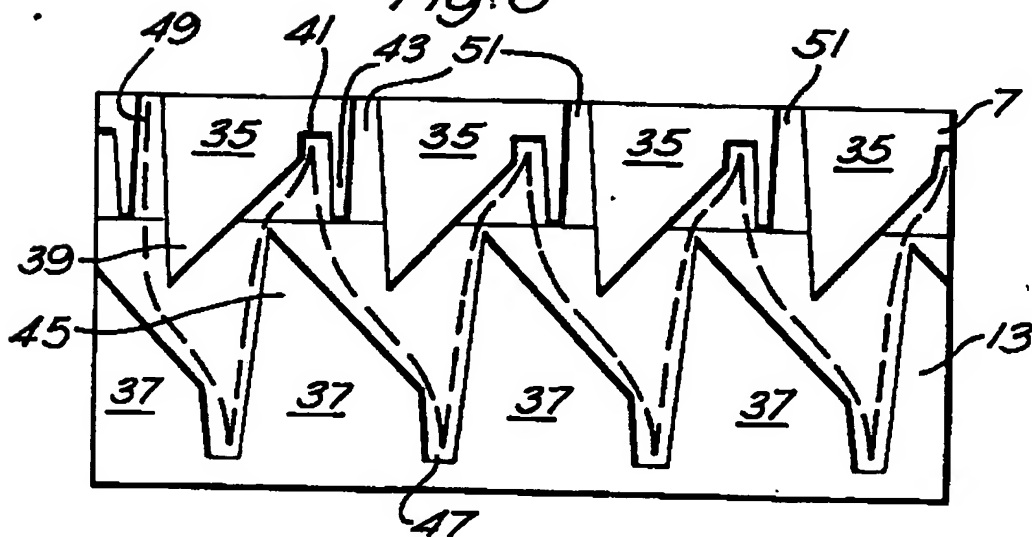


Fig. 3



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Fig. 4a

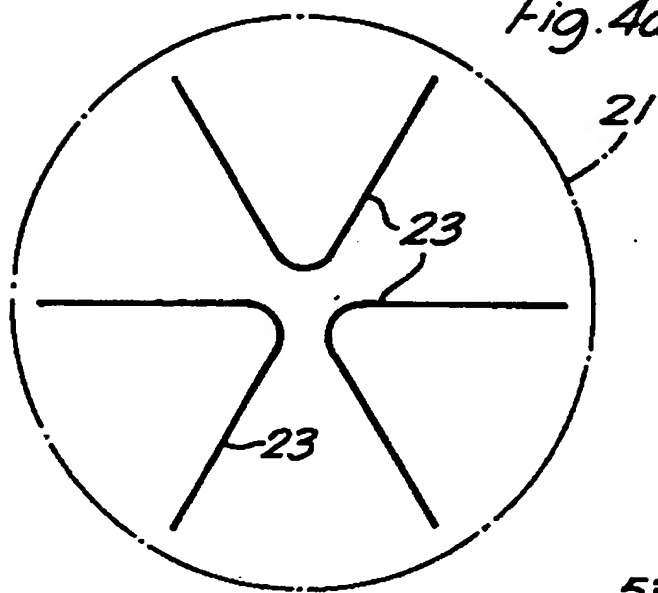


Fig. 4b

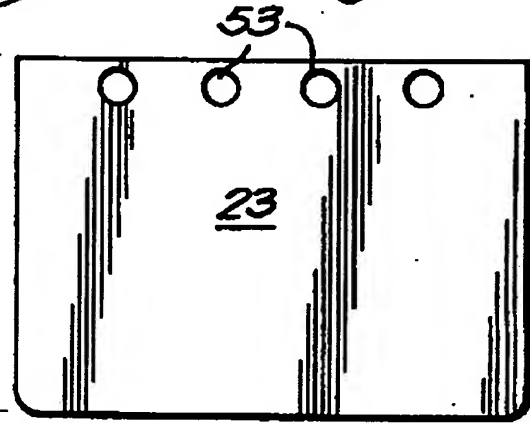
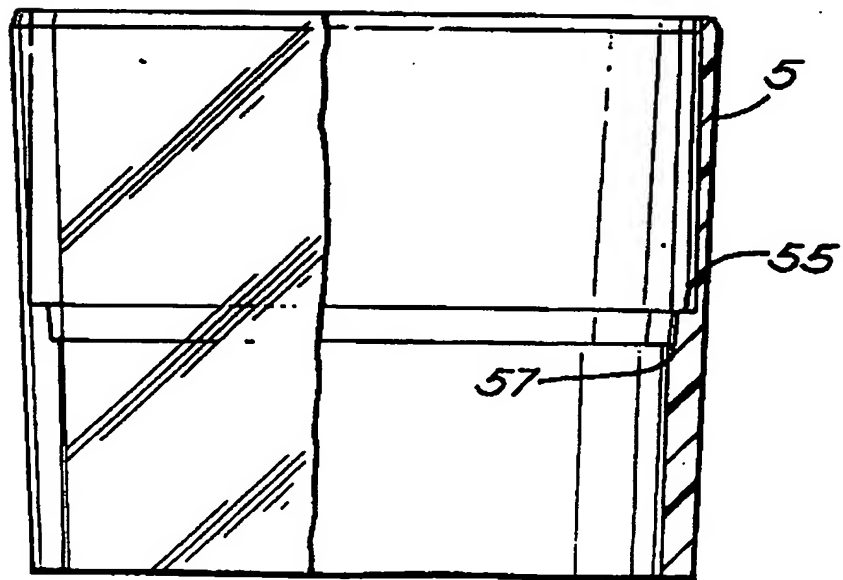


Fig. 5



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Fig. 6

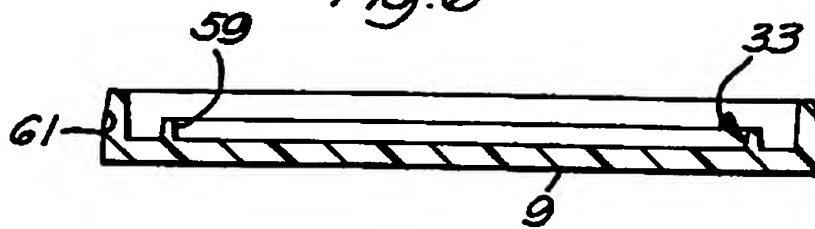


Fig. 7a

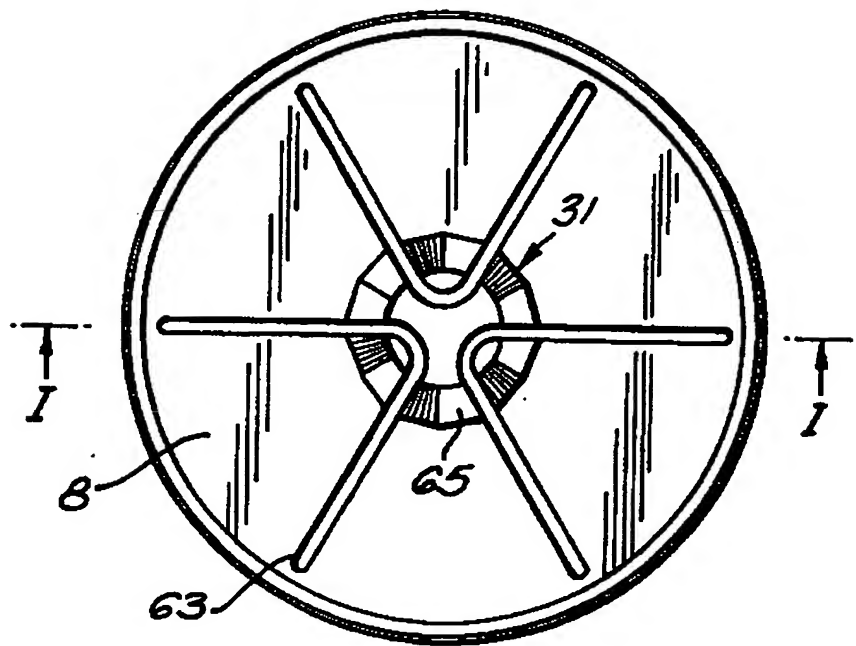
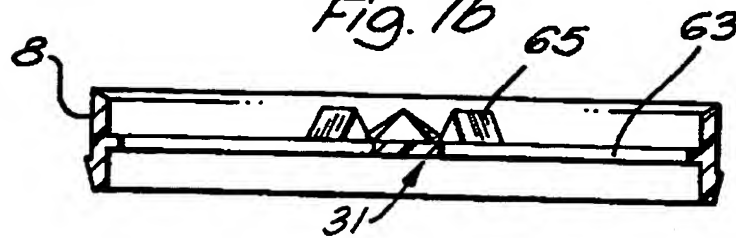


Fig. 7b



### IMPROVEMENTS TO FOOD CHOPPERS

This invention relates to improvements to hand held food  
5 choppers of the kind having a cup-shaped housing to be  
placed over the food to be chopped.

There are currently a large number of different food  
choppers on the market. However, the majority of these  
10 choppers are of a substantially similar construction. Known  
food choppers, as these traditional food choppers will be  
referred to hereafter, typically comprise a cup-shaped  
housing to be disposed in an inverted position over the  
foodstuffs to be chopped, an actuating stem disposed in an  
15 upper region of the housing and projecting upwardly out of  
the housing, an impact button fixed to an upper portion of  
the actuating stem, a cutting member fixed to a lower end  
of the actuating stem, a stripper plate disposed in a lower  
portion of the cup-shaped housing for removing chopped food  
20 from the cutting member, a transparent cylinder which  
engages a lower portion of the cup shaped housing and means  
for rotating the blade member upon actuation of the device  
by the application of a downward force on the impact button.

25 These food choppers, whilst adequately fulfilling the  
purpose for which they were designed, suffer from a number  
of disadvantages that impair their use.

Firstly, the cutting member typically comprises a convoluted  
30 zigzag blade mounted in an injection moulded plastic dish.  
This convoluted blade causes food to become trapped at the  
apex of the convolutions thereby causing the device to seize  
up and become jammed. In addition, the convoluted blade  
requires that the stripper plate has a similar convoluted  
35 aperture formed therein. Thus, a significant disadvantage  
subsists in that the user often finds difficulty in aligning  
the blade and corresponding stripper plate aperture.

Secondly, these food choppers suffer from a disadvantage that the rotating means, whilst enabling the blade member to rotate, also causes the actuating stem to rotate thereby causing significant discomfort to the user who grasps the  
5 actuating stem during use. Attempts have been made in the past to rectify this problem, but these attempts have been largely ineffectual.

Finally, known food choppers require that the chopper be  
10 operated on a flat planar surface which gives rise to problems regarding food leakage and possible bacterial contamination.

It is an object of the present invention therefore to  
15 provide a food chopper that has an improved rotation member whereby the member grasped by the user is not subjected to any rotational force.

It is a further object of the present invention to provide  
20 a cutting member that has a blade of a shape that is without convolutions thereby enabling the easy removal of chopped food from the blade.

It is a still further object of the present invention to  
25 provide means for allowing the easy assembly of the blade member and stripper plate.

It is a still further object of the present invention to provide means for attachment to the base of the device which  
30 prevents food leakage and is impervious to moderate temperature fluctuations.

Thus, in accordance with the present invention, there is provided a device for chopping foodstuffs comprising: a cup  
35 shaped housing to be disposed in an inverted position over the foodstuff to be chopped; an actuating stem disposed in the housing and extending therefrom, said actuating stem having an impact button provided thereon; a cutting member

provided within the housing to make impact with the foodstuff when pressed in a downward direction through a stripper plate in opposition to energy storage means; an actuating axle for joining said cutting member to said  
5 actuating stem; a cylinder mountable on said housing thereby defining an area into which the foodstuffs to be chopped may be placed; and rotation means acting with said actuating stem to rotate said cutting member on actuation of the device.

10

In one embodiment, the cutting member comprises a cutting plate having at least one cutting blade fixed therein.

Preferably, the cutting plate has three blades mounted  
15 therein and each of said blades is approximately v-shaped, has an apex angle of 60 degrees and is mounted at 60 degrees to its neighbour.

Preferably, the cutting blades have apertures formed in an  
20 upper portion thereof, said apertures being filled with material at the time of manufacture of said cutting plate.

In another embodiment, the chopper further comprises a dish mounted on said cylinder. The dish may have sealing means  
25 provided on its periphery. The sealing means may comprise an inner curb and an outer curb spaced therefrom, the spacing being slightly larger than the cylinder thickness.

Preferably, the stripper has a number of apertures formed  
30 therein, the number of apertures corresponding to the number of cutting blades, and has blade alignment means mounted on a top surface thereof. The blade alignment means may comprise a number of members each of which has a substantially triangular cross-section. These members may be  
35 disposed between apertures.

The energy storage means may comprise a spring circumscribing said actuation axle and acting on said



actuation stem and an interior wall of said housing.

In another embodiment, the rotation means comprises a set of  
cans mounted on said actuation stem, a set of upper  
projections and a set of lower projections formed in between  
5 said upper projections, said projections being sized so as  
to retain said cans snugly therewithin.

The lower projections may be formed on an interior wall of  
an upper portion of said housing and the upper projections  
10 may be formed on an interior wall of a second rotation  
member joined thereto.

Alternatively, the upper and lower projections may be formed  
integrally with said housing and on an interior wall  
15 thereof.

Preferably, each of said upper projections comprise a first  
v-shaped member, an upper notch and a second v-shaped member  
and each of said lower projections comprise an inverted v-  
20 shaped member and a notch.

In operation, each of said cans is moved from each upper  
notch to an adjacent upper notch upon actuation of the  
device.  
25

Preferably, the impact member is free to rotate about said  
actuating stem in isolation of any rotational movement of  
said actuating stem.

30 A preferred embodiment of the present invention will now be  
described, by way of non-limitative example, in conjunction  
with the following drawings, in which:-

Figure 1 is a sectional elevation of the food chopper  
35 according to the present invention,

Figure 2a is an elevation of the plunger assembly,

Figure 2b is a plan view of the top of the plunger assembly of figure 2a,

Figure 3 is a development of the rotating means according to  
5 the present invention,

Figure 4a is a plan view of the base of the cutting member according to the present invention,

10 Figure 4b is an elevation of one of the cutting blades of Figure 4a,

Figure 5 is a sectional view of the transparent cylinder,

15 Figure 6 is a cross sectional view along a diameter of the base sealing member (the dish),

Figure 7a is a plan view of the top surface of the stripper plate, and Figure 7b is a cross sectional view along the  
20 line I---I of figure 7a.

Figure 1 illustrates a food chopper 1 according to the present invention. The chopper 1 comprises a cup shaped housing 3, a transparent cylinder 5, upper rotation means 7,  
25 a stripper plate 8, a dish 9, an impact member 10 provided with a top cap 11 and plunger means 12. The cup-shaped housing 3 is provided with lower rotation means 13 formed integrally on an interior wall of an upper portion of the cup-shaped housing 3.

30

The stripper plate 8 is sized so as to be fittable within a lower portion of the cup shaped housing 3 and the transparent cylinder 5 is sized so as to be able to fit over the cup shaped housing and stripper plate and to hold them  
35 securely therewithin. The transparent cylinder creates an aperture into which the foodstuffs to be chopped may be inserted when the device is fully assembled.

The plunger means 12 comprises an actuating stem 15, an actuating axle 17, spring means 19 circumscribing said axle 17, a cutting plate 21 and cutting blades 23. The plunger means 12 is disposed within the cup shaped housing 3 and  
5 extends either side of an internal wall 4 in the cup shaped housing 3.

The actuating stem is provided with cam means 25 which are engageable with the upper 7 and lower 13 rotating means and  
10 together serve to rotate the cutting blades 23 upon actuation of the device. The actuating stem 15 is additionally provided with a knob 27 which is sized so as to be engageable with a corresponding aperture in the impact member 10. The knob 27 is of hollow construction and is  
15 capable of secure engagement with the axle 17. The impact member 10 is capable of rotational movement independent of any rotational movement undertaken by the plunger means 12.

The cutting blades 23 are securely fixed to the cutting  
20 plate 21. The cutting plate 21 is securely fitted to the axle 17 and is capable of rotational movement therewith. The axle 17 passes through an aperture in the internal wall 4 so that the cutting plate 21 is brought into close proximity with a lower surface of the interior wall 4. The axle 17 is  
25 fitted, at its upper end, to the actuating stem knob 27. The spring means 19 is provided between and in abutment with the actuating stem 15 and the interior wall 4. The actuating stem 15, axle 17, cutting plate 21 and cutting blades 23 are securely fitted together and capable of sympathetic rotation  
30 upon actuation of the device.

The impact member 10 is rotatably mounted on the knob 27 and is free to rotate in isolation of any rotational movement undertaken by the knob 27. The impact member 10 is fixed to  
35 the actuating stem 15 by way of washers 29. The top cap 11 provides access to the washers 29 during assembly of the device and is securely fitted to the impact member 10 during use.

The stripper plate 8 is provided, on its upper surface, with blade alignment means 31 which serve to facilitate the insertion of the blades 23 into the stripper 8. The stripper plate 8 rotates in synchronisation with the blades 23 when the device is actuated.

The dish 9 is provided with sealing means 33 which enables the dish 9 to be fitted to the transparent cylinder 5 regardless of any ambient temperature fluctuation that may cause thermal expansion or contraction of the dish 9.

In order to operate the device, foodstuffs are placed within a bowl formed by the transparent cylinder 5 and dish 9. The stripper plate 8 is then inserted into the transparent cylinder 5 in such a manner that it lies substantially parallel with the dish 9. The cup shaped housing 3 is then inserted into the transparent housing in an inverted position as shown in Figure 1.

20

Pressure on the impact member 10 causes the plunger means 12 to move vertically down towards the foodstuff to be chopped. The cams 25 interact with the upper 7 and lower 13 rotating means and serve to rotate the plunger means 12 in a clockwise direction. Continued application of pressure causes the blades 23 to chop the foodstuff provided within the bowl until the blades 23 come into abutment with the dish 9. At this point, the spring means 19 is at its fully compressed position so that, upon release of the downwards pressure, the spring means 19 enables the plunger means 12 to move upwardly into the housing 3. On the upward stroke, the cams 25 interact with the upper 7 and lower 13 rotating means once more to rotate the plunger 12 means in a clockwise direction. Obviously, the direction of rotation is immaterial; however it is important that the plunger means 12 rotates in the same direction on both the upward and downward strokes. It should also be noted that the impact member 10 does not rotate in sympathy with the plunger means

12 and indeed this is a significant advantage of the instant invention.

Repeated actuation and release of the device causes the blades 23 to be rotated and the foodstuffs to be finely chopped.

Figures 2a and 2b are enlarged views of an upper portion of the plunger means 12 of Figure 1. The axle 17, knob 27, actuating stem 15 and cams 25 may be clearly seen. The axle 17 may be push fitted with the knob 27, or other means may be employed. The actuating stem 15 is provided with a cam 25 at 90 degree intervals around its periphery. Obviously, a different number of cams may be employed without departing from the scope of the appended claims. However, testing has shown that best results are obtained with four cams provided at 90 degree intervals.

Figure 3 is a development of interior walls of the upper 7 and lower 13 rotating means of Figure 1.

The upper 7 rotating means is provided with four sets of upper protrusions 35 on an interior wall of the upper rotating means 7. The lower rotating means 13 is provided with four corresponding lower protrusions 37 on an interior wall of the housing 3 and disposed so as to fall into spaces left by the upper protrusions 35.

Each of the upper protrusions 35 comprise a first v-shaped member 39, an upper notch 41 and a second v-shaped member 43. Each of the lower protrusions 37 comprise an inverted v-shaped protrusion 45 and a lower notch 47.

The upper 7 and lower 13 protrusions are sized so as to hold the cams 25 in secure engagement thereabout without touching any other part of the actuating stem 15. The broken line 49 indicates the path of one of the cams 25 through the upper 7 and lower 13 rotation means.

As shown in Figure 1, the upper 7 and lower 13 rotation means may be formed from two separate bodies, or they may be integrally moulded on an interior wall of an upper  
5 portion of the cup-shaped housing 3.

The upper 7 rotation means is preferably engaged with the lower 13 rotation means and joined thereto by glue or other known permanent retaining means.

10

The actuating stem 15 is inserted into the upper 7 and lower 13 rotating means by way of apertures 51 provided between the upper protrusions 35. The plunger means 12 is then depressed until the cams 25 are clear of the second v-shaped members 43. The plunger means 12 is then operated  
15 until the cams 25 fall into the upper notches 41. The plunger means 12 is then held within the upper 7 and lower 13 rotating means until such a time as the above operation is repeated in reverse.

20

In operation, the plunger means 12 is depressed against the action of the spring means 19 until the cams 25 abut the inverted v-shaped member 37. The inverted v-shaped member 37 causes the cams 25 and attached actuating stem 15, axle 17,  
25 cutting plate 21 and blades 23 to rotate about the axle 17 until the cams 25 fall into the lower notches 47. At this point the blades 23 are fully extended from the housing 3 and are in abutment with the dish 9. This point will be referred to hereafter as the down point.

30

To return the blades 23 within the housing 3, pressure is released from the plunger means 12 and the cams 25 rise up a wall of the adjacent inverted v-shaped member 37 due to the action of the spring means 19 on the interior wall 4.  
35 The cams 25 then contact again the first v-shaped member 35 on the upper rotating means 7 and the actuating stem 15 is rotated once more until the cams 25 return to the upper notches 41. At this point, the blades 23 are fully withdrawn

into the housing 3 and the chopper 1 is in its up position. The second v-shaped member 43 prevents the cams 25 from travelling into the aperture 51 thereby releasing the actuating stem 15 from the rotating means.

5

Repeated application and release of pressure on the plunger means 12 causes the cams 25 and attached stem 15, axle 17, cutting plate 21 and blades 23 to rotate about the axle 17 and chop the foodstuff disposed within the bowl formed by the transparent cylinder 5 and the attached dish 9. Each cycle of cam movement from the up position through the down position and back to the up position causes the blades 23 to rotate by 90 degrees.

15 Obviously, the scope of the appended claims is not limited to the number of cams and corresponding v-shaped members provided within the device. It will be obvious to one skilled in the art that the number of cams and corresponding v-shaped members may be varied at will. However, it is  
20 essential that there are at least as many upper and lower protrusions as cams.

It will also be obvious that one could provide two cams for engagement with four sets of protrusions. Each cam would be  
25 provided at 180 degree intervals on the periphery of the actuating stem and the corresponding projections would be formed at 90 degree intervals on the interior of the housing and upper rotating means. Similar multiples are also conceived.

30

Figure 4a is a plan view of the base of the cutting plate 21 and shows the angular placement of the three blades 23. Each blade 23 is of a substantially v-shape and has an angle of approximately 60 degrees at its apex. Each v-shaped blade 23  
35 is disposed at 60 degrees from its neighbour.

This arrangement allows the blades 23 to have a maximum apex angle whilst also affording maximum chopping efficiency.

Obviously, a larger or smaller number of blades 23 may be provided. However, the wide apex angle of each v-shaped blade 23 is a feature of the present invention that allows for easy cleaning of the chopper blades 23. Thus, increasing  
5 the number of blades 23 and consequently decreasing the apex angle would not offer any improvement to the operation of the device.

Figure 4b shows a side elevation of one of the blades 23  
10 depicted in figure 4a before it has been permanently attached to the cutting plate 21. Each blade 23 has a number of apertures 53 formed in an upper arm portion thereof. The cutting plate 21 may then be formed from injection moulded plastic in such a way that, at the time of forming the  
15 cutting plate 21, the plastic is injected through the blade apertures 53 thereby permanently securing the blades 23 to the cutting plate 21. Other attachment methods may be employed if preferred.

20 Figure 5 is a sectional elevation of the transparent cylinder 5 showing retention ledges 55 and 57. The lower retention ledge 57 is sized so as to receive and support the stripper plate 8. The upper retention ledge 55 is sized so as to receive and support the cup shaped housing 3. The  
25 stripper plate 8 is free to rotate in sympathy with the rotation of the blades 23 and attached cutting plate 21, axle 17, actuating stem 15 and cams 25.

Obviously, it is not essential that the cylinder 5 be  
30 manufactured from a transparent material; however, the transparency of the cylinder 5 does allow the user to ascertain when the foodstuffs have been chopped to a satisfactory degree.

35 Figure 6 is a cross sectional view along a diameter of the dish 9. The sealing means 33 may be seen in cross section.

The sealing means 33 comprises an inner curb 59 and an outer



curb 61 spaced therefrom. The outer curb 61 is taller than the inner curb 51 in order to facilitate the location of the transparent cylinder 5 with the sealing means 33.

5 The inner 59 and outer 61 curbs are spaced by a distance that is slightly greater than the transparent cylinder wall thickness. In this way, the transparent cylinder 5 abuts either one of the inner 59 and outer 61 curbs depending on the ambient temperature and any consequential expansion or  
10 contraction of the dish 9.

Figure 7a is a plan view of a top surface of the stripper plate 8. The stripper plate 8 is provided with three apertures 63 which allow the blades 23 to be loosely located  
15 therewithin.

Towards the centre of the plate 8, there is provided the blade alignment means 31. The blade alignment means 31 comprises a number of members 65 arranged in a circle about  
20 the centre of the plate 8. Each member 65 is of a substantially triangular section and abuts an aperture 63 on either side.

In this way, the blades 23 will be encouraged to enter the  
25 apertures 63 if the device is assembled and actuated when the blades 23 are slightly out of alignment with the stripper apertures 63.

Figure 7b is a cross sectional view along the line I---I of  
30 figure 7a and gives an indication of the shape of each member 65 of the blade alignment means 31.

For optimum performance, there are twice as many blade alignment means members 65 as blades 23 and apertures 63.  
35 However, a fewer number of alignment members 65 may be provided if desired.

It will be understood, of course, that various modifications

may be made to the device disclosed herein without departing from the scope of the appended claims.

For example, preferably the various pieces of the device are  
5 "snap-fitted" together, but the pieces may be joined together by a ridge and groove system or other known means.

**CLAIMS**

1. A device for chopping foodstuffs comprising:
  - a cup shaped housing to be disposed in an inverted  
5 position over the foodstuff to be chopped;
  - an actuating stem disposed in the housing and extending therefrom, said actuating stem having an impact button provided thereon;
  - a cutting member provided within the housing to make  
10 impact with the foodstuff when pressed in a downward direction through a stripper plate in opposition to energy storage means;
  - an actuating axle for joining said cutting member to said actuating stem;
  - 15 a cylinder mountable on said housing thereby defining an area into which the foodstuffs to be chopped may be placed; and,
  - rotation means acting with said actuating stem to rotate said cutting member on actuation of the device.
- 20 2. A chopper according to claim 1 wherein said cutting member comprises a cutting plate having at least one cutting blade fixed therein.
- 25 3. A chopper according to claim 2 wherein said cutting plate has three blades mounted therein.
4. A chopper according to claim 3 wherein each of said blades is approximately v-shaped, has an apex angle of 60  
30 degrees and is mounted at 60 degrees to its neighbour.
5. A chopper according to any one of claims 2 to 4 wherein said cutting blades have apertures formed in an upper portion thereof, said apertures being filled with material  
35 at the time of manufacture of said cutting plate.
6. A chopper according to any preceding claim further comprising a dish mounted on said cylinder.

7. A chopper according to claim 6 wherein said dish has sealing means provided on its periphery.
- 5 8. A chopper according to claim 7 wherein said sealing means comprises an inner curb and an outer curb spaced therefrom, the spacing being slightly larger than the cylinder wall thickness.
- 10 9. A chopper according to any one of claims 2 to 8 wherein said stripper has a number of apertures formed therein, the number of apertures corresponding to the number of cutting blades, and has blade alignment means mounted on a top surface thereof.
- 15 10. A chopper according to claim 9 wherein said blade alignment means comprises a number of members each of which has a substantially triangular cross-section.
- 20 11. A chopper according to claim 10 wherein each member is disposed between apertures.
12. A chopper according to any preceding claim wherein said energy storage means comprises a spring circumscribing said  
25 actuation axle and acting on said actuating stem and an interior wall of said housing.
13. A chopper according to claim 1 wherein said rotation means comprises a set of cams mounted on said actuation  
30 stem, a set of upper projections and a set of lower projections formed offset from said upper projections, said projections being sized so as to retain said cams snugly therewithin.
- 35 14. A chopper according to claim 13 wherein said lower projections are formed on an interior wall of an upper portion of said housing and said upper projections are formed on an interior wall of a second rotation member

joined thereto.

15. A chopper according to claim 13 wherein said upper and lower projections are formed integrally with said housing  
5 and on an interior wall thereof.

16. A chopper according to any one of claims 13 to 15 wherein each of said upper projections comprises a first v-shaped member, an upper notch and a second v-shaped member.  
10

17. A chopper according to any one of claims 13 to 16 wherein each of said lower projections comprises an inverted v-shaped member and a notch.

15 18. A chopper according to claim 17 wherein each of said cams is moved from each upper notch to an adjacent upper notch upon actuation of the device.

19. A chopper according to any preceding claim wherein said  
20 impact member is free to rotate about said actuating stem in isolation of any rotational movement of said actuating stem.

20. A food chopper for chopping foodstuffs substantially as hereinbefore described and as shown in the appended  
25 drawings.

**Patents Act 1977**  
**Examiner's report to the Comptroller under Section 17**  
**(The Search report)**

17

Application number  
GB 9420298.3

**Relevant Technical Fields**

(i) UK Cl (Ed.M) A4C

(ii) Int Cl (Ed.5) B02C

Search Examiner  
R B LUCK

Date of completion of Search  
22 DECEMBER 1994

**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii)

Documents considered relevant following a search in respect of Claims :-  
1-20

**Categories of documents**

- |  |   |
|--|---|
| <p><b>X:</b> Document indicating lack of novelty or of inventive step.</p> <p><b>Y:</b> Document indicating lack of inventive step if combined with one or more other documents of the same category.</p> <p><b>A:</b> Document indicating technological background and/or state of the art.</p> | <p><b>P:</b> Document published on or after the declared priority date but before the filing date of the present application.</p> <p><b>E:</b> Patent document published on or after, but with priority date earlier than, the filing date of the present application.</p> <p><b>&amp;:</b> Member of the same patent family; corresponding document.</p> |
|--|---|

Category	Identity of document and relevant passages		Relevant to claim(s)
X	GB 1558549	(LEIFHEIT INT)	1 at least
X	GB 889577	(ZYSSET K)	1 at least
X	GB 853837	(ZYSSET K)	1 at least
X	GB 797748	(POPEIL SJ)	1 at least
X	GB 771734	(GIMELLI S)	1 at least

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